

Ultrafast laser inscription: overview and application to active and nonlinear device fabrication

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Talk abstract: Ultrafast lasers offer the capability to micro-modify transparent materials in an unprecedented manner. By focusing ultrashort laser pulses inside the bulk of a material, local material properties such as the refractive index or the etch rate can be modified with high precision. This technique allows the fabrication of complex 3D devices by simply translating the substrate through the focus, directly inscribing structures. The talk first gives an overview of the concept and processes occurring during fabrication. This is then followed by presenting and discussing the fabrication of waveguide structures in active and nonlinear materials such as Erbium-doped glasses, Bismuth-doped glasses and Chalcogenide glasses.

Speaker biography: Nicholas Psaila graduated with the BSc (Hons) degree in Physics from Imperial College London in 2003, followed by the MSc in Photonics and Optoelectronic Devices from Heriot Watt and St Andrews Universities in 2004. He has been a member of the Nonlinear Optics group at Heriot Watt University since 2005, working on the fabrication of waveguide devices in active and nonlinear materials, and currently holds the post of Research Associate.